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WOMAN'S WORK IN ASTRONOMY¹

HER WORK IN THE PAST, HER GREATER WORK IN THE FUTURE,
HER DUTY TOWARD HERSELF AND HER OBLIGATIONS
TO ASTRONOMY FOR THE BETTERMENT AND
ENLIGHTENMENT OF MANKIND

BY DOROTHEA KLUMPKE ROBERTS

From the early ages of history unto the present times, in which the earthly abode of man has witnessed the most terrible of all catastrophes—Cain slaying his brother Abel on a world-wide scale—woman has appeared in the field of astronomy under the three-fold rôle of mother, priestess and helpmate. The mother of olden times, like the mother of our days, whether ignorant or wise, sad or joyful, stricken with poverty or blessed with worldly riches, has again and again glanced heavenward, and in her own fashion, untutored or tutored, has questioned the Sun, Moon and stars, imparting to the infant in her arms her love for things so great and marvelous in Nature that the sight of them filled her with reverence and awe.

It was not long in human history before the priestess appeared officiating in all sincerity and humility by the side of her husband, invoking with him the great power that they knew to govern this physical world of ours. Let us unroll the ancient papyri of the Egyptians and listen for a few brief moments to Hunefer, the scribe, and his wife Nasha, a priestess in the College of Aman Ra at Thebes, singing a hymn of praise to the rising Sun.² . . .

After the priestess, woman appeared as helpmate in the field of astronomy. She was the daughter, or the wife, or the widow, or the sister, or the niece, or the friend of the elect who, as civilization moved westward, consecrated themselves unto the study of Astronomy. I had the honor of invoking the memories of those faithful toilers and devotees of Science, in 1899, at a meeting of the Astronomical Society of France in Paris, on February 1st, and again, on July 29th, at the International Congress of Women held in London.

These tributes were published in the *Bulletin de la Société Astronomique de France* for 1899, and in the *Observatory*, published in London for August, 1899.

¹Read at the Pasadena meeting of the *Ast. Soc. Pac.*, June 19-21, 1919.

²Space limitations compel the omission of this hymn.

The names of those women and their astronomical labors are well known to all. I, therefore, shall not here recall them. Astronomers have honored them by giving feminine names to the planetoids, circling between *Mars* and *Jupiter*, the discovery of which dates from the beginning of the nineteenth century.

In these latter years the center of influence and power has been shifted by civilization unto the United States of America.

American astronomy is not yet one hundred and fifty years old. Professor Holden (*Smithsonian Annual Report*, 1899) says until the Revolution American science was but English science transplanted.

Astronomy along the Pacific Coast has been in existence for less than twenty-five years and the achievements attained are beyond all expectations.

In astronomy, as in every other branch of human knowledge, America is in the foremost rank, the whole world to-day looks unto her banner of stars and stripes for guidance and assistance.

The part performed by women in the American development is most praiseworthy. In astronomy, under the direction of her learned and eminent teachers she has proved herself not only most efficient in research work, but, being rich herself, she has endowed science with great riches, thus enabling research work to be carried on.

Women like Phoebe Hearst, like Catherine Bruce, like Anna Palmer Draper, women like Williamina P. Fleming, Annie J. Cannon, Harriet S. Leavitt were and are equally necessary to extend human knowledge far into space and time.

It is not only in the great observatories of the world that woman has distinguished herself, she proved herself equally gifted when on the computing staff, be it in Paris, at the Bureau des Longitudes, or in Washington at the office of the Nautical Almanac, or in Berkeley under the direction of Professor Leuschner. Those women computers—there are hundreds of them—recall with honor the women of the past such as Madame Lepaule in France helping Clairault in his computation of the orbit of Halley's Comet, Teresa and Madalena Manfredi assisting their brother, director of the Bologna Observatory, in astronomical ephemerides, or Margaritha Kirch rendering truly scientific services unto her German country.

At the various observatories of the world we now find women performing the duties of secretary, women translating scientific papers, women taking part in astronomical work, be it by direct

observation or by photographic or spectrographic observation, we find women in the time service, as at the Paris observatory thruout and before the great war.

At the European observatories still engaged in the International photographic charting of the heavens, women have rendered service often without ever coming before the world's notice. At the Vatican Observatory for the last ten years the measurements of the astrophotographic plates have been intrusted to Italian nuns. At Potsdam, so close to Berlin, a British lady was employed for two or more years in measuring the astrophotographic plates of the Potsdam zone, assisted by a Prussian military official who inscribed the numbers. Miss Everett, having completed her work, returned to England.

In the higher educational centers, the American teacher finds herself equipped with an astronomical outfit that will be a source of inspiration to her European sisters when Europe, rejuvenated, rises out of its present convulsions.

At the Universities women attending courses in astronomy from a cultural point of view have, in a short time, acquired sufficient learning to enable them to write articles of esthetic and educational value.

And they who are at too great a distance to attend in person these courses in astronomy still are brought under the beneficial influence of astronomy by reading the monthly papers of the Astronomical Societies published thruout the world; the articles written and the observations made by women show what an uplifting subject of meditation the heavens are to them.

In the home, the wife of the astronomer has proved herself his worthy scientific and loving helpmate; what more beautiful example in these last years than that of the late Lady Huggins; Mrs. Walter Maunder in England; the late Madame Camille Flammarion in France; Mrs. David P. Todd and Mrs. W. W. Campbell in America. There are thousands and thousands of women like these. I cannot mention them all.

Useful and efficient as woman's work in astronomy may have been in the past, her work in the future will be far greater and more beneficial to the human race, for a sisterhood of all noble-minded women now encircles the earth. Out of this great war for Liberty, woman has arisen triumphant, she has taken possession of herself by giving herself in service unto others. Thruout these

years and months of unspeakable human suffering, woman has been the ministering angel upon earth.

She knows that her duty unto herself is that of being a torch bearer of Truth. And what can be more helpful unto her in that sacred mission than the study of astronomy?

When woman becomes aware of what she owes unto astronomy, when she understands that all sciences contribute to the furthering of astronomy, when she but catches a glimpse of the wealth of information and the treasures of reward held in store for her by astronomy, then she will not rest until every child in every school thruout the world be taught with the a b c's the rudiments of astronomy.

Then she will confer with the directors of the boards of education and the directors of astronomical centers and she will see to it that astronomy be diffused among all classes of society. She will establish popular observatories such as the one Mr. Charles Burckhalter in Oakland is directing for the diffusion of learning. She will see to it that the toiling multitude of men and women who labor so hard during their working hours and who are so eager for enjoyment when the work is done, be instructed in astronomy and that they see depicted on the screens and on the films of the motion picture theaters to which they flock so readily, the wonderful creations of the universe which, up to the present time, have only been beheld by the privileged ones.

The multitudes will be taught where they are and what they are; in learning of their material and physical insignificance, they will become conscious of their moral greatness and the reign of the millennium will be at hand.

Then never again will there be found on earth hands nor minds nor hearts daring to desecrate the sublimest of all sciences by using her noble instruments as prototypes for destruction and annihilation

On the contrary, every human being, like the Egyptian princess Nasha, and her learned husband, Hunefer, the scribe, will daily greet and daily observe the Sun at his rising, daily observe the Sun at his setting, and will glance heavenward during the day and often thruout the night, inwardly singing praises of gratitude to the UNKNOWABLE ONE of which all things in heaven and on earth are but outward manifestations.

June 18, 1919.